

Name: Solutions

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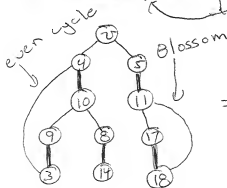
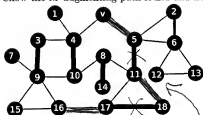
Graph Theory Quiz 2 (31 May 2019)

Open book, open notes, open neighbor.

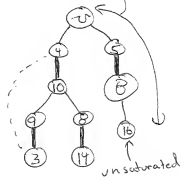
1. We wish to use our BFS-based Blossom Algorithm on the graph below to identify an M -augmenting path and increase the size of the given match M .

Start from vertex v and draw the BFS tree containing M -alternating paths. Stop when you find an M -augmenting path. Identify the blossoms, if any, discovered during the search and draw the resulting contracted search tree.

Show the M -augmenting path found and new match M' .

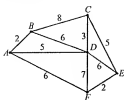


new M' M -augmenting path

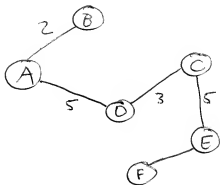


$$M\text{-aug} = \{v, 5, 11, 18, 17, 16\}$$

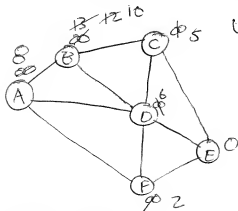
2. Use any algorithm to identify the minimum spanning tree in the weighted graph below.



Using Kruskal's

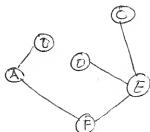


3. Your friend Dave told you that a shortest paths tree is equal to a minimum spanning tree for a given graph. Using the same graph from above, create a shortest paths tree from vertex E and prove Dave wrong.



Using Dijkstra's

=>



Processing order:
E, F, C, D, A, B

2

Dave == wrong!